

# (12) UK Patent Application (19) GB (11) 2 364 994 (13) A

(43) Date of A Publication 13.02.2002

(21) Application No 0112288.6

(22) Date of Filing 21.05.2001

(30) Priority Data

(31) 0013165

(32) 01.06.2000

(33) GB

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(51) INT CL<sup>7</sup>

A47J 31/40 // B67D 1/00

(52) UK CL (Edition T )

B8N NB NP N6B1B2A

(56) Documents Cited

DE 029611088 U

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(58) Field of Search

UK CL (Edition S ) B8N NB ND NP

INT CL<sup>7</sup> A47J 31/40 , B67D 1/00 3/00 , G01F 11/00  
11/18

Online: EPODOC, PAJ, WPI

(54) Abstract Title

**Apparatus for dispensing liquid and metered doses of powder**

(57) The apparatus 10 comprises a housing 12 of which the lower part of the front and sides is recessed to accommodate one or more containers such as bottles. The housing 12 accommodates a water compartment 16 at the base of which protrudes a water dispenser 20. The apparatus also has a powder compartment 22 which feeds in to a powder dispenser 26 located directly beneath the powder compartment. In use, a baby feeding bottle is located within the housing and causes a predetermined volume of a milk formula to be dispensed from the powder compartment 22 through the dispenser 26. Once the powder is within the bottle the bottle is then filled with water from the water compartment 16 through the water dispenser 20. Once a predetermined volume of water has been dispensed the formula and the water are then mixed in the bottle.

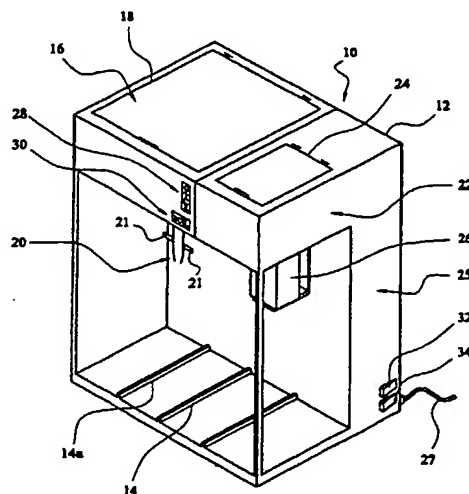
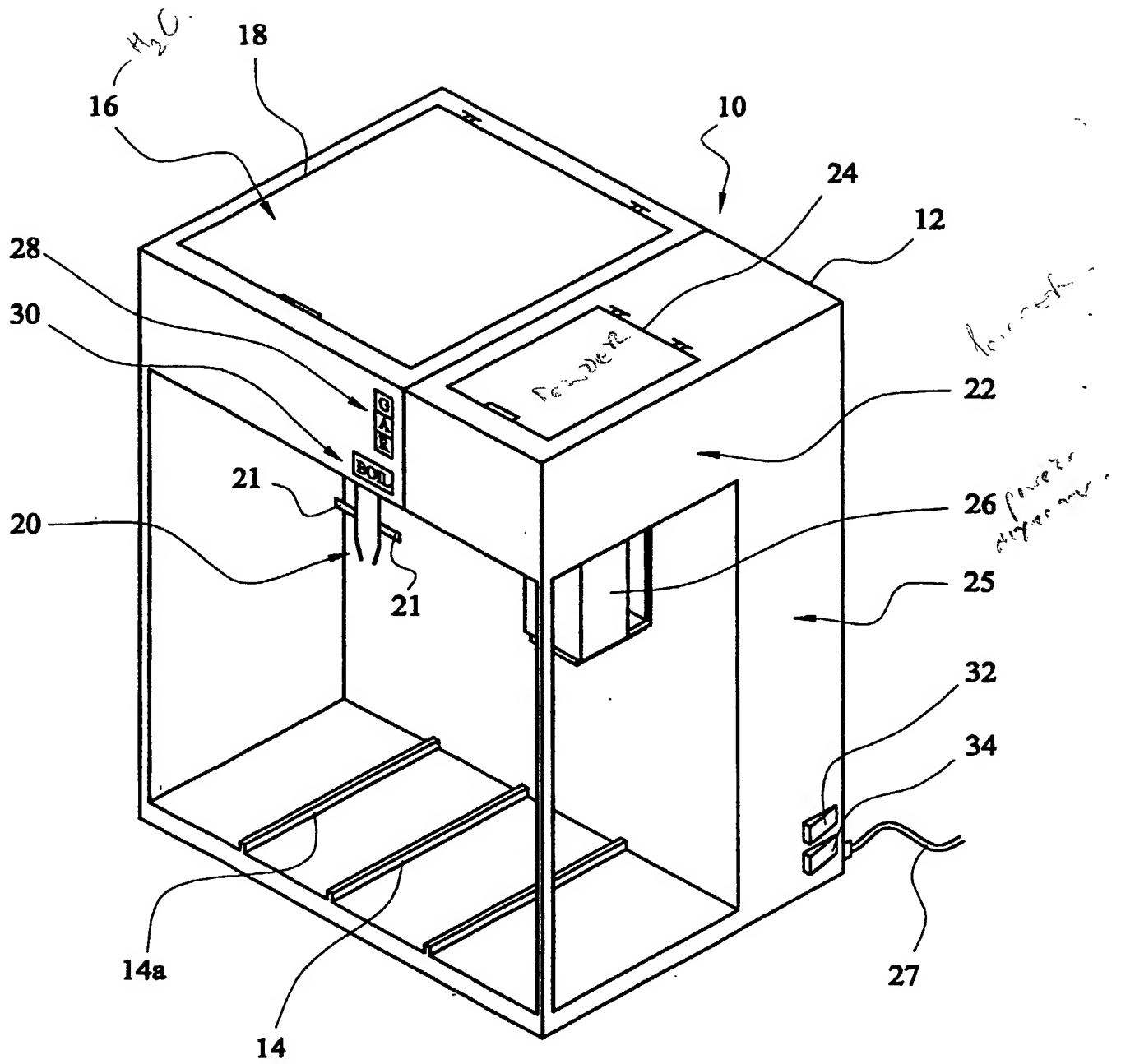


FIG. 1



**FIG. 1**

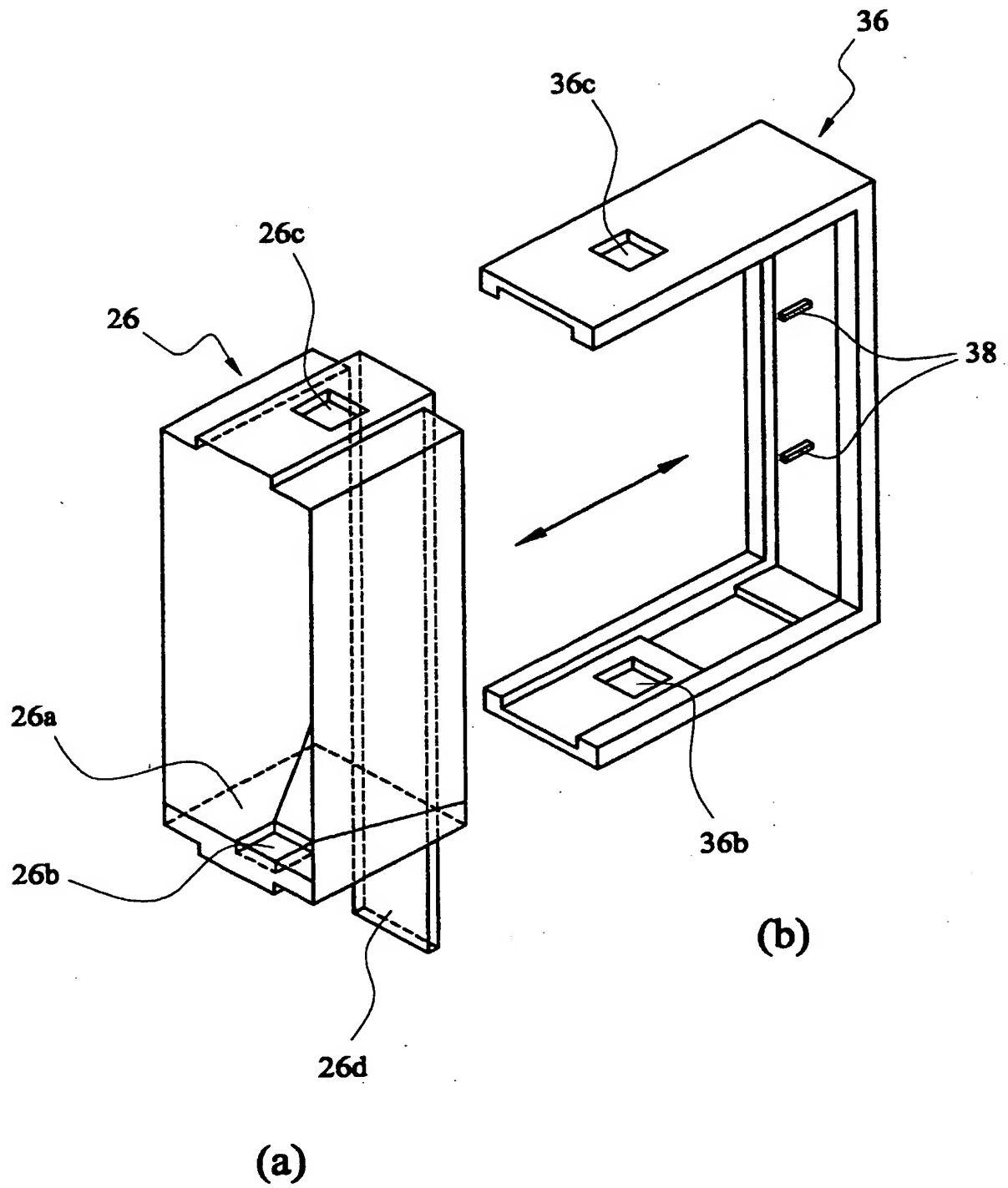
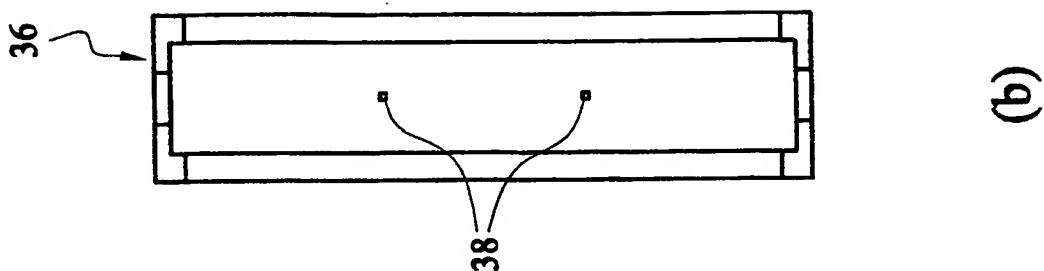
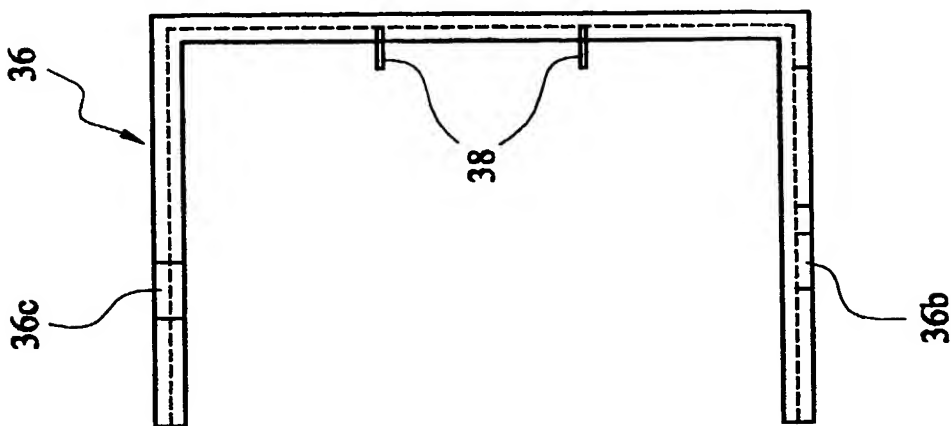


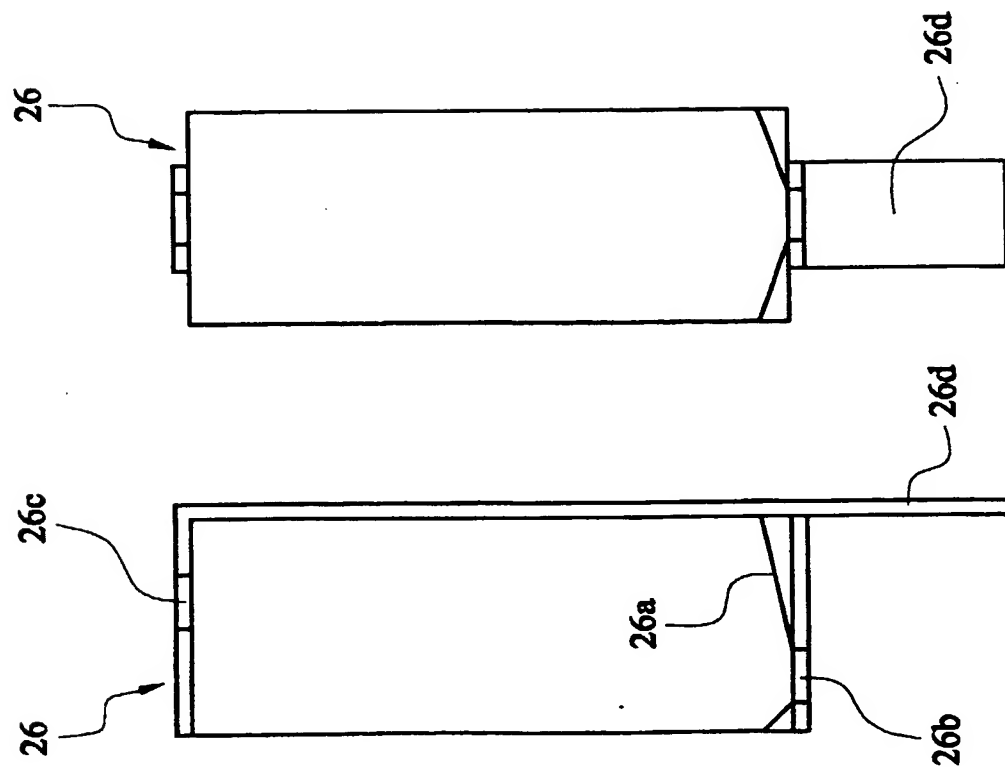
FIG. 2



(a)



(b)



(a)

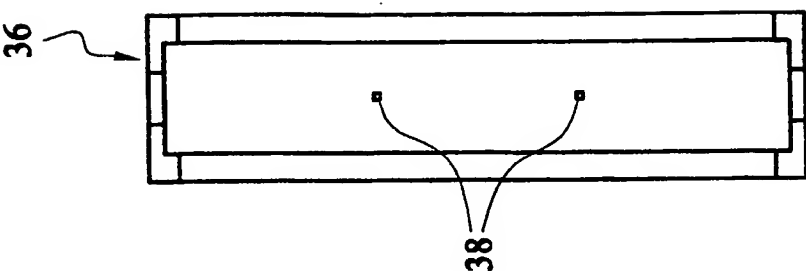
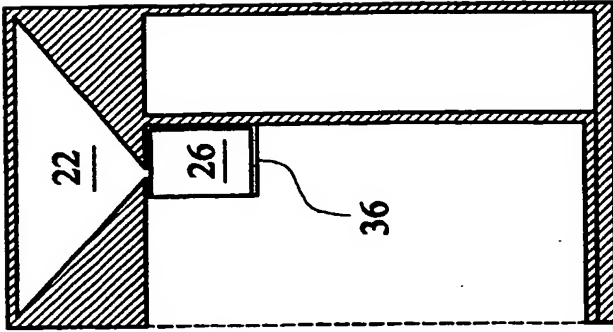
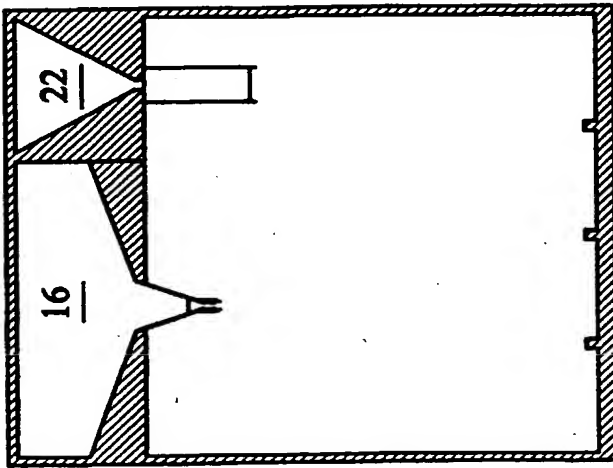


FIG. 4

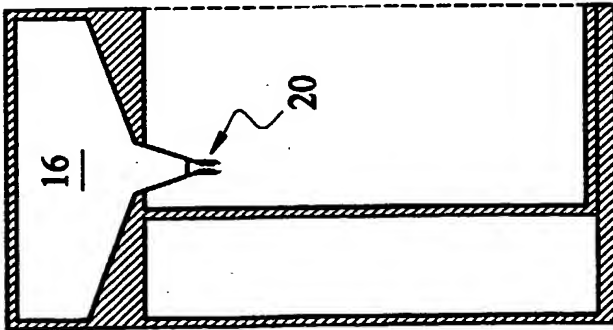
FIG. 3



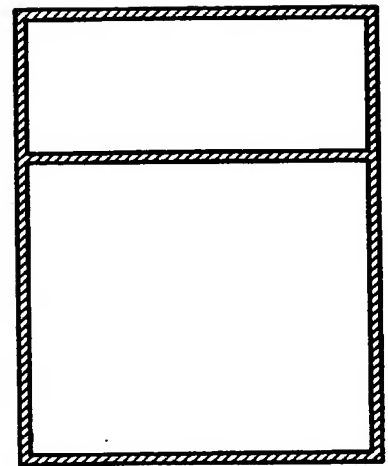
(c)



(b)



(a)



(d)

FIG. 5

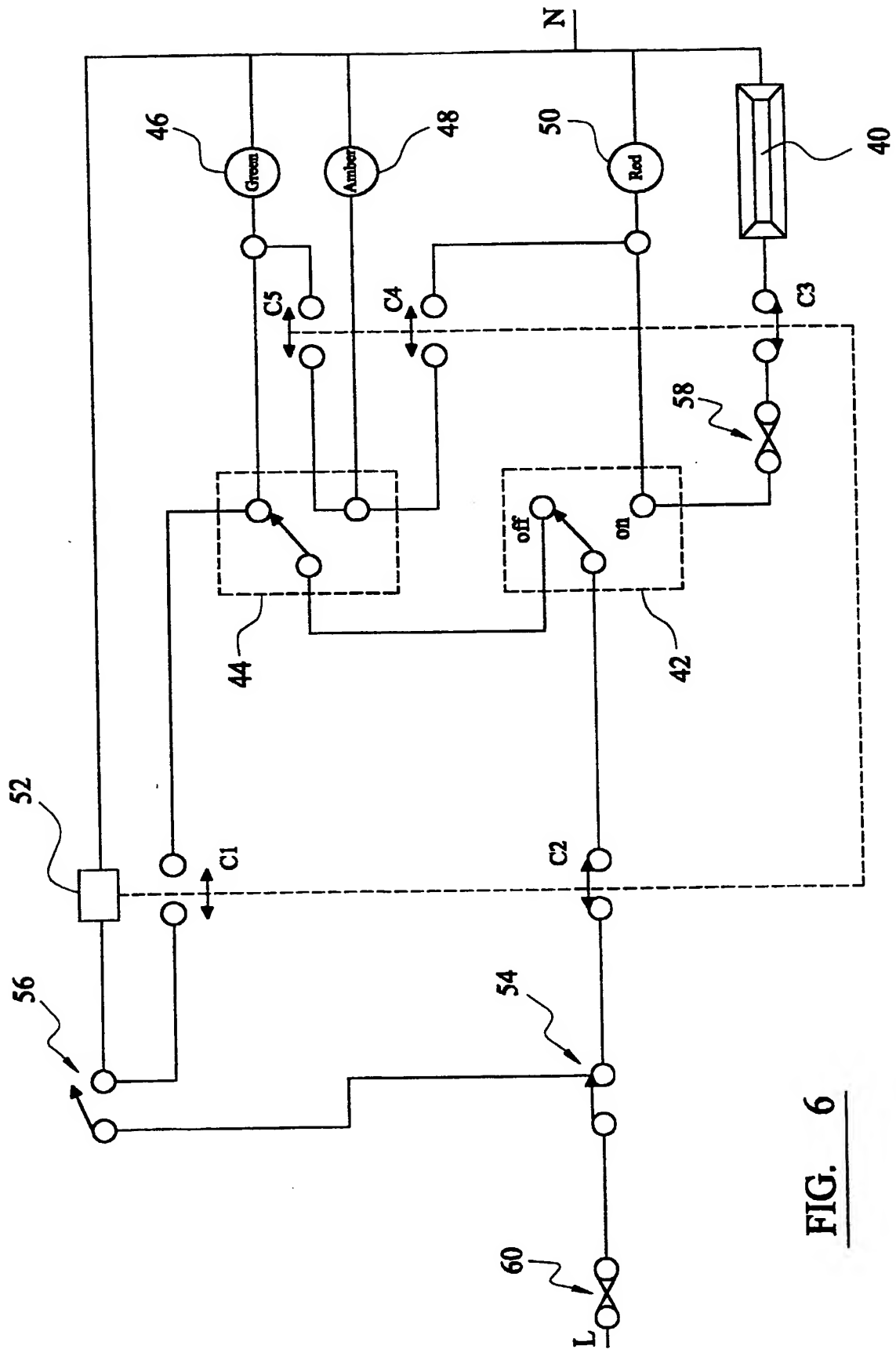


FIG. 6

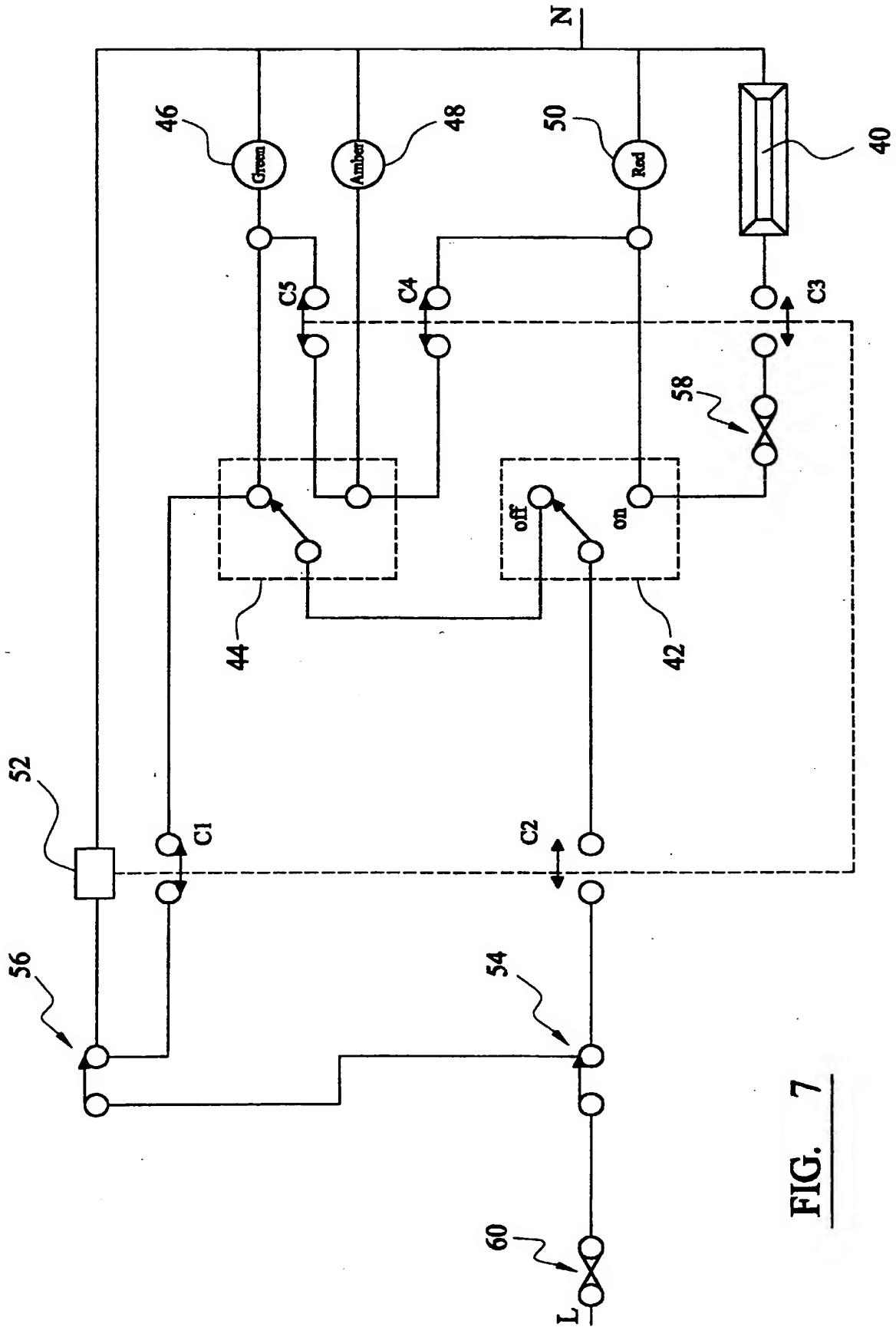


FIG. 7

**DISPENSING APPARATUS**

The present invention relates to an apparatus for dispensing liquid and a predetermined quantity of powdered  
5 or particulate material (hereinafter referred to as "powder") into a container. The invention is particularly, though not exclusively, useful for dispensing baby feeding formula into a bottle.

10 Currently, when mixing a bottle feed for a baby it is necessary to measure accurately the volume of powder to be mixed with a corresponding volume of water. This is achieved by use of a measuring scoop which then has to be levelled off using a knife or similar tool, which is both  
15 time consuming and messy. Also, when making a feed it is usually necessary to count a certain number of scoops being placed into the bottle, and it is often difficult to remember how many scoops of powder have been used.

20 Attempts have been made to circumvent these difficulties, for example by providing ready mixed formula in cartons, or by providing a bottle with powder and water in two separate compartments which are then mixed together when required to be used. Such products are single use items  
25 and are too expensive to use on a regular basis.

It is therefore an aim of embodiments of the present invention to provide apparatus which facilitates the measuring and dispensing of a required amount of powder  
30 which addresses the problems of conventional methods and products, whether referred to herein or otherwise.

According to the present invention there is provided apparatus for the dispensing of a liquid and a powder comprising:

5 a first compartment for holding the powder;

dispensing means for dispensing the powder from the first compartment;

10 a second compartment for holding the liquid;

dispensing means for dispensing the liquid from the second compartment; and

15 means for controlling the amount of powder dispensed.

Preferably, the powder is milk formula.

Preferably, the liquid is water.

20

Preferably, the powder and liquid are dispensed into a container such as, for example, a baby's feeding bottle, and mixed together in said container.

25 Preferably, the means for controlling the amount of powder dispensed comprises a container disposed beneath the first compartment which is automatically filled from the first compartment and is of a predetermined volume capacity.

30 Conveniently, the powder is dispensed from the container which is in turn filled from the first compartment.

Preferably, the container is movable between a filling position in which the interior of the container is in communication with the first compartment, and an emptying position in which the container is isolated from the first compartment and in which position powder may be emptied from the container.

Conveniently, the container is normally urged by spring means or equivalent into the filling position and is pushed into the emptying position by a force applied manually.

Preferably, the container is mounted for sliding movement relative to a retaining component which is secured to the apparatus.

Preferably the retaining component is a bracket with upper and lower arms.

Conveniently, the container and retaining component have interengaging parts, for example protrusions and channels, by means of which the container may slide within the retaining component.

Preferably, there are apertures provided in the container and in the retaining component whereby alignment of the respective apertures enables filling and/or emptying of the container.

Preferably, either or both of the first and second compartments are funnel-shaped to allow powder and/or liquid to be dispensed under gravity.

Preferably, either or both of the first and second compartments include scale means to indicate the amount of powder and/or liquid remaining in the respective compartment.

5

Preferably the liquid dispensing means comprises a plunger type valve which is normally kept closed by pressure of liquid from above but which may be opened by pushing upwards to raise the plunger.

10

Preferably, the apparatus includes means for electrically heating and/or boiling the liquid.

Preferably, the apparatus also includes thermostat means  
15 for maintaining the heated liquid at the correct temperature.

Conveniently, the apparatus includes at least one  
20 indicator means to indicate a stage of operation of the apparatus.

Preferably, the apparatus includes at least two indicator  
means, one to indicate that the liquid is heating and one  
25 to indicate that the liquid is at the correct temperature to use.

Preferably, the apparatus also includes a further  
indicator means to indicate that the liquid is in the  
process of cooling to the correct temperature.

30

Conveniently, the apparatus is mains operated and preferably includes suitable circuit protection such as cut-outs and fuses.

Preferably, the first and second compartments are located side by side in an upper region of the apparatus.

- 5 Preferably, at least a portion of the lower part of the front of the apparatus is recessed to accommodate one or more containers to be filled.

Preferably, the apparatus includes a storage compartment  
10 for holding one or more space containers and other accessories.

Preferably, the storage compartment is located at the rear of the apparatus.

15

For a better understanding of the invention, and to show how embodiments of the same may be carried into effect, reference will now be made, by way of example, to the accompanying diagrammatic drawings in which:

20

Figure 1 is a perspective view of apparatus according to an embodiment of the present invention,

Figure 2 comprises perspective views of the powder  
25 container and associated bracket,

Figures 3 and 4 comprise side and front views of the container and bracket of figure 2,

30 Figure 5 comprises side, front and plan views of the apparatus showing internal detail,

Figure 6 is a circuit diagram for an electrical version of the apparatus, and

Figure 7 shows the circuit diagram of figure 6 in lamp  
5 test mode.

Referring to the drawings and to figure 1 in particular, an embodiment of the apparatus 10 according to the present invention comprises a housing 12 of which the lower part  
10 of the front and sides is recessed to accommodate one or more containers such as bottles. A bottle rack 14 may be provided at the base of the recessed portion, to assist in keeping the bottles upright and stable during use.

15 The bottle rack has three protruding ridges 14a, 6mm in both height and width, providing therebetween bays for receiving the bottles.

The rest of the housing 12 accommodates the main  
20 functional components of the apparatus, namely a water compartment 16 (with hinged lid 18) at the base of which protrudes a water dispenser 20, a powder compartment 22 with hinged lid 24 which feeds into a powder dispenser 26 located directly beneath the powder compartment. In the  
25 electrical version of the apparatus a water heating element is provided with associated connection 27 to mains power supply and electrical circuitry as well as indicator lamps 28, thermal switch 30, a lamp test switch 32 and on/off switch 34.

30

As shown in figure 2, powder from the container 22 is used to fill a powder dispenser 26 which has a volume of approximately  $20\text{cm}^3$ , preferably manufactured from clear

plastic. Alternative dispensers of different volumes may be provided. The dispenser 26 is mounted in a plastic arm bracket 36, in such a manner that it may be slid back and forth (as indicated by the arrow) within the arms of the bracket. The base 26a of the dispenser is funnelled so as to allow powder to be gravity fed through the hole 26b into the bottle located below.

In the normal position (i.e. when powder is not being dispensed) an upper aperture 26c in the dispenser (which is laterally offset from lower aperture 26b) is aligned with upper aperture 36c provided in the upper arm of bracket 36, allowing powder to fall into the dispenser under gravity from the container above, whilst at the same time the lower aperture 26b of the dispenser is out of alignment with a lower aperture 36b provided in the lower arm of bracket 36b, so that the dispenser 26 will normally be full of powder.

When it is desired to dispense powder from the dispenser 26, the dispenser 26 is pushed into the bracket 36, compressing two springs 38 provided on the inner face of the back of the bracket and bringing lower apertures 26b, 36b into alignment and at the same time taking upper apertures 26c, 36c out of alignment. As a result, the powder in dispenser 26 falls out of aligned holes 26b, 36b under gravity. The back of the dispenser 26 is extended downwardly into a lever 26d against which the neck of the bottle may be pressed in order to impart the necessary force to dispenser 26. Upon releasing this force, the springs 38 urge the dispenser 26 back into the normal position in which the dispenser is re-filled with powder.

due to the upper apertures 26c, 36c coming again into alignment.

In figure 5 the internal details of the water and powder compartments can be seen. The water compartment has a liquid capacity of approximately 1.5 litres with the area of the lid being approximately 150mm x 150mm, and is funnelled to allow water to flow under gravity into the water dispenser 20, which is preferably valve operated. Normally the valve is kept closed by the pressure of water from above, but when an upwards force is applied to the arms 21 of the valve from below, for example by engaging the arms with the neck of the bottle, the valve is opened by pushing up a plunger (not shown) and water is dispensed into the bottle under gravity.

The powder container 22 has a volume capacity of approximately 250cm<sup>3</sup> with the area of the lid being approximately 75mm x 75mm, and is funnelled to allow the powder to be gravity fed into the dispenser 26.

Both the water and powder containers include a scale marker engraved around the circumference of the respective inner compartment, to indicate the amount of water/powder present.

Other features of the apparatus include a storage compartment 25 at the rear of the apparatus, accessible by means of a hinged door of area approximately 170mm x 170mm, for storage of a spare bottle, teats, caps and bottle cleaning brushes.

The apparatus is preferably constructed from light weight, high impact resistant and heat resistant plastic, and the walls of the housing 12 are approximately 5mm thick whilst the base is approximately 10mm thick.

5

Whilst the apparatus is capable of functioning entirely as a mechanical device (in which case cooled boiled water at the correct temperature would be poured into the water compartment 16, the following electrical components may be incorporated for additional convenience. As shown in figure 6 these components comprise a 1.75 kw submersible heating element 40, a two-way thermal switch 42 rated to 10A, a two-way thermostat 44 rated to 10A, three neon indicator lamps 46, 48, 50, in green, amber and red, a five pole contactor 52 rated to 10A of the 'break before make contacts' type, a single pole on/off isolating switch 54 rated to 10A, a single pole push button switch 56 rated to 10A and fuses 58, 60 of 8A and 10A respectively. The heating element 40 is located in the water compartment as low as possible, mounted on heat resistant supports (not shown).

The heating cycle is initiated by switching on the apparatus by means of on/off switch 54 and switching on the thermal switch 42 whereupon the red lamp 50 is illuminated ('water heating up' phase). Once the water has boiled, the thermal switch 42 automatically switches off the heating element and the red lamp 50 goes out. The thermal switch 42 at the same time as switching off the heating element connects the circuit to the thermostat 44 which controls the green and amber lamps 46, 48. As long as the water remains too hot, the amber lamp 48 (but not the green lamp 46) is illuminated until at the appropriate

temperature the thermostat 44 switches off the amber lamp 48 and illuminates the green lamp 46, indicating that the water is at the correct temperature to use. Should the water not be used and it subsequently cools down too much, the thermal switch 42 is manually switched on and the foregoing sequence repeated.

The lamp test switch 50 and contactor 52 may be used to test the operation of all three neon lamps 46, 48, 50, as shown in figure 7.

Should a fault occur on the thermal switch 42 it will remain in the 'off' position permanently. Should a fault occur on the thermostat 44 it will remain in the amber position permanently.

The heating element 40 is protected by an 8A fusible link 58. Should an overload or short circuit fault occur the fusible link would rupture, isolating the element. The element also incorporates a thermal cut-out for protection against overheating.

The electrical circuit also incorporates a 10A fusible link 60 on the incoming power supply. Should an overload or short circuit fault occur anywhere on the system, the fusible link will rupture, isolating the entire circuit.

If any of the neon lamps 46, 48, 50 are suspected to be defective, then the lamp test switch 50 can be pressed. (All lamps will illuminate if working correctly).

If all lamps operate satisfactory on test but the red neon lamp 50 does not illuminate when the thermal switch 42 is

pressed 'on', then this indicates a fault with the thermal switch.

5 If all lamps operate satisfactory on test and the red neon lamp 50 is illuminated when the thermal switch 42 is pressed on, but the water does not boil, then this indicates a fault with the element 40.

10 If all lamps operate satisfactory on test but the amber lamp 48 does not extinguish some time after the water has boiled and the green lamp 46 does not illuminate, then this indicates a fault with the thermostat 44.

15 If the green lamp 46 does not illuminate, when the on/off switch 54 is in the 'on' position before the thermal switch 42 is pressed 'on' then this indicates no power supply.

20 In use, the contents of the dispenser 26 are emptied one or more times into a bottle, and the required amount of water is then added using water dispenser 20, 21. Alternatively, the water may be dispensed first, followed by the powder.

25 The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and  
30 documents are incorporated herein by reference.

All of the features disclosed in this specification (including any accompanying claims, abstract and

drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

5

Each feature disclosed in this specification (including any accompanying claims, abstract and drawings), may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each  
10 feature disclosed is one example only of a generic series of equivalent or similar features.

The invention is not restricted to the details of the  
15 foregoing embodiment(s). The invention extend to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so  
20 disclosed.

25

**Claims**

1. Apparatus for the dispensing of a liquid and a powder comprising:

5 a first compartment for holding the powder;

dispensing means for dispensing the powder from the first compartment;

10 a second compartment for holding the liquid;

dispensing means for dispensing the liquid from the second compartment; and

15 means for controlling the amount of powder dispensed.

2. Apparatus according to claim 1 in which the powder is milk formula.

20 3. Apparatus according to claim 1 or claim 2 in which the liquid is water.

4. Apparatus according to any preceding claim in which the powder and liquid are dispensed into a container and  
25 mixed together in said container.

5. Apparatus according to any preceding claim in which the means for controlling the amount of powder dispensed comprises a container disposed beneath the first  
30 compartment which is automatically filled from the first compartment and is of a predetermined volume capacity.

6. Apparatus according to claim 5 in which the powder is dispensed from the container which is in turn filled from the first compartment.

5 7. Apparatus according to claim 6 in which the container is movable between a filling position in which the interior of the container is in communication with the first compartment, and an emptying position in which the container is isolated from the first compartment and in  
10 which position powder is emptied from the container.

8. Apparatus according to claim 7 in which the container is normally urged by spring means into the fill position and is pushed into the emptying position by a force  
15 applied manually.

9. Apparatus according to any of claims 5 to 8 in which the container is mounted for sliding movement relative to a retaining component which is secured to the apparatus.

20 10. Apparatus according to claim 9 in which the retaining component is a bracket with upper and lower arms.

11. Apparatus according to claim 9 or claim 10 in which  
25 the container and retaining component have integrated parts, by means of which the container may slide within the retaining component.

12. Apparatus according to any one of claims 9 to 11 in  
30 which there are apertures provided in the container and in the retaining component whereby alignment of the respective apertures enables filling and/or emptying of the container.

13. Apparatus according to any preceding claim in which the first compartment is funnel shaped to allow powder to be dispensed under gravity.

5

14. Apparatus according to any preceding claim in which the liquid dispensing means comprises a plunger type valve which is normally kept closed by pressure of liquid from above but which may be opened by pushing to raise the  
10 plunger.

15. Apparatus according to any preceding claim in which the apparatus includes means for electrically heating and/or boiling the liquid.

15

16. Apparatus according to claim 15 in which the apparatus includes thermostat means for maintaining the heated liquid at the correct temperature.

20 17. Apparatus according to any preceding claim in which first and second compartments are located side by side in an upper region of the apparatus.

18. Apparatus according to any preceding claim in which at  
25 least a portion of the lower part of the front of the apparatus is recessed to accommodate one or more containers to be filled.

19. Apparatus according to any preceding claim in which  
30 the apparatus includes a storage compartment for holding one or more containers and other accessories.

20. Apparatus according to claim 19 in which the storage compartment is located at the rear of the apparatus.

21. Apparatus for the dispensing of a liquid and a powder  
5 substantially as herein described with reference to, and  
as shown in any of the accompanying drawings.



Application No: GB 0112288.6  
Claims searched: 1-21

Examiner: Emma Tonner  
Date of search: 19 November 2001

## Patents Act 1977 Search Report under Section 17

### Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): B8N (NB, ND, NP)

Int Cl (Ed.7): A47J 31/40; B67D 1/00, 3/00; G01F 11/00, 11/18

Other: Online: EPODOC, PAJ, WPI

### Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	DE 296 11 088 (LANNER) see English abstract U1	1, 2, 3, 13, 15-18
X	FR 2 620 017 A1 (TORTIGNON & DUCHAMP) see English abstract and page 2, lines 16-22	1-4, 13, 15, 17, 18
X, P	US 6 173 117 B1 (CLUBB) - see column 4, lines 50-62	1-4, 13, 15-18
X	US 3 915 207 (GREENFIELD JR. et al.) - see column 5, lines 42-52	1-4, 13, 15-18

X Document indicating lack of novelty or inventive step  
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